

Serial No.: 09/780,036
Filed: February 9, 2001
Title: A METHOD OF SYNCHRONIZING THE REPLAY OF AUDIO DATA IN A NETWORK OF COMPUTERS

Group Art Unit: 2661
Examiner: Ian N. Moore

REMARKS

The foregoing amendments are to correct the specification as required in the Action and the drawings, as required in the Action, and to present the claims in terms that clearly distinguish patentably from the prior art cited and applied in the Action. No new matter has been added and the basis for all changes and corrections is found in the original specification as filed.

The claims as currently presented refer to determining the average travel time (in claim 7) or the minimum travel time (in claim 8) of voice packets, and delaying the voice packets by a time to synchronize the replay on destination computers (stations or clients) within earshot. The Examiner objects that the application does not disclose how the average/minimum travel times are to be determined. The Examiner further objects that it is not clear how the time is chosen, or how this leads to synchronizing the replay.

The first voice packet received sets the "start time" (page 5 line 8 specification). Since each voice packet has a particular duration, the time that a subsequent packet is expected to arrive ("expected time", page 5 line 8-10 specification) can be compared to its actual arrival time.

If subsequent voice packets are, for example, earlier than expected, this could be because the first voice packet happened to take longer than the average time taken to travel (page 5 line 17-19 specification).

The start time can be corrected by subtracting the amount by which the voice packet has arrived earlier than expected, or, equivalently, calculating an "average start time" to replace the original "start time" (page 5 line 24-25

specification). The amount by which the first voice packet anticipates the expected value, or the average start time, is equal to the average difference between the actual arrival times and the expected arrival times of subsequent packets. Thus, the "average travel time" in this context refers to the point of time when a packet would arrive if it took the average travel duration. The term "average travel time" for later packets is cognate with the term "average start time" for the first packet. Claim 7 was been amended to make this clear. It will also be seen that various statistical methods can be straightforwardly applied using the actual arrival times of subsequent packets to determine the point of time when a packet would arrive if it took the average travel duration.

Of course, this technique equally applicable where the first voice package travels faster than average.

A voice packet is thus delayed after its arrival until its replay so that the point in time when it is replayed is the same time as if the voice packet had arrived at the average travel time and been delayed for a time. The time should be sufficiently long that not many late packets are ignored (and clearly not so long as to unnecessarily delay the message) — but it will be seen that a suitable time can easily be determined for a particular network system, but the specific value is largely arbitrary. Since the computers are within earshot, and the data source sends the packets to each computer at the same time, the packets to the different computers will, on average take the same time to travel (page 8, lines 17-18 of the abstract). Thus the point of time when a packet would arrive, if it took the average travel duration, is the same for neighbouring computers, and delaying each computer's packets to play a predetermined time after this point will synchronize neighbouring computers.

The actual average duration of travel is irrelevant and never calculated.

As neighbouring computers have similar average travel time points, the point in time when a packet would arrive if it took the minimum travel duration (i.e. the "minimum travel time") will also be common to the computers. Therefore this point in time can be determined and used in the same way as the point of time when an average travel duration packet would arrive. Similarly, the actual minimum duration of travel is irrelevant and never calculated.

The reference to a "variable time" in the abstract has been corrected. It is clear that the actual delay applied to a packet is varied or adapted to equal the delay added to a theoretical packet arriving after traveling for an average duration (or minimum duration). It is now clear that the abstract, as amended, refers to a delay time added as shown in Figures 4 and 5 newly added.

The present invention as recited in claims 7 to 12 is aimed at systems where several computers within earshot receive data packets from a single source, and the output of these receiving computers is synchronized.

Zarros (USP5,682,384) is concerned with receiving and synchronizing data packets from two different sources. In the example given (column 1, lines 38-40) three participants are located in New York, California, and New Jersey. This type of system was discussed in the specification on page 2 under background.

In Zarros, the problem identified is that route between different participants (in particular the route between two or more sources and the one receiver) varies in distance, and interparticipational synchronization is broken. Moreover, the participants are not within earshot, rather Zarros is aimed at dealing with

geographically dispersed participants.

It is submitted that the skilled man would not find the problem addressed by Zarros relevant, or its solution helpful, in synchronizing computers within earshot according to claims 7 to 12.

Teng (US5,930,473), like Zarros, is concerned with receiving signals from more than one source, and synchronizing them on a single machine. Like Zarros, the routes that different signals will take will not have a similar average travel time and different recipients are not within earshot and do not have to be synchronized. Therefore the skilled man would find nothing in Teng to take him closer to the invention of claims 1 to 12.

Text labels have now been added to the flow chart shown in FIG. 1, each text label being directly derived from the description of the relevant block in the description (page 5, line 4 to page 6, line 9).

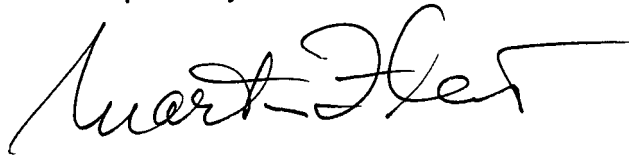
In light of the foregoing remarks, this application should be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

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It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time, time sufficient, to effect a timely response, and shortages in this or other fees, be charged, or any overpayment in fees be credited, to the Deposit Account of the undersigned, Account No. 500601 (Docket no. 722-X01-004)

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Martin Fleit", with a long horizontal flourish extending to the right.

Martin Fleit, Reg. #16,900

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